## REMARKS

Applicant requests favorable consideration and allowance of the subject application inview of the preceding amendment and the following remarks.

Claims 18-26, 29-31, 34 and 37-39 are presented for examination. Claims 18, 26, 29-31 and 34 are independent. Claims 18, 26, 29-31 and 34 have been amended to clarify features of the subject invention, while claim 39 has been added to recite additional features of the subject invention. Support for these changes and claim can be found in the original application, as filed. Therefore, no new matter has been added.

Applicant requests favorable reconsideration and withdrawal of the rejections set forth in the above-noted Office Action.

Claims 18-22, 24, 25, 29 and 30 have been rejected under 35 U.S.C. § 102 as being anticipated by U.S. Patent No. 6,211,944 to Shiraishi. Claim 23 has been rejected under 35 U.S.C. § 103 as being unpatentable over the Shiraishi patent in view of U.S. Patent No. 4,918,583 to Kudo et al. Claim 37 has been rejected under 35 U.S.C. § 103 as being unpatentable over the Shiraishi patent in view of U.S. Patent No. 6,040,894 to Takahashi. Claim 38 has been rejected under 35 U.S.C. § 103 as being unpatentable over the Shiraishi patent in view of U.S. Patent No. 5,345,292 to Shiozawa et al. with regard to the claims as currently amended, these rejections are respectively traversed.

Independent Claims 18, 29 and 30 as currently amended are directed to an illumination optical arrangement that illuminates a surface to be illuminated using light from a light source. In the illumination optical arrangement, a diffractive optical element forms a desired light intensity distribution upon a predetermined plane. An angular distribution transforming unit

transforms the angular distribution of light incident or to be incident on the diffractive optical element into plural predetermined distributions. A multiple beam producing unit has the predetermined plane as its light entrance surface and a light projecting element superimposes light rays from the multiple beam producing unit one upon another on the surface to be illuminated. In Claim 29, a projection optical system projects a pattern of a mask illuminated with light from the illumination optical system onto a wafer. In Claim 30, a projection optical system is used to transfer a pattern of a mask onto a wafer and the transferred pattern is developed.

The feature of "an angular distribution transforming unit for transforming an angular distribution of light incident or to be incident on said diffractive optical element into a plurality of predetermined distributions" in Claims 18, 29 and 30 is disclosed at lines 22 through 24 of page 18 in the specification and is discussed at lines 12 through 16 of page 19 in the specification. No new matter is believed to have been added.

In Applicant's view, Shiraishi discloses a projection exposure arrangement that has an illumination system and a projection system. The illumination system may include a plurality of optical integrators that form different secondary light sources. The illumination system illuminates a pattern with light from a secondary light source selected based on the pattern. The projection system projects an image of the pattern on a predetermined plane. The projection exposure apparatus may also include a light shielding device having a cross-like portion extending in first and second directions defined by the components of the pattern. The projection exposure apparatus may also include four off-axis secondary light sources where a ratio of a

numerical aperture of a light beam from each of the four secondary light sources to a numerical aperture of the projection optical system is substantially 0.1 through 0.3.

According to the invention defined in Claims 18, 29 and 30, an angular distribution transforming unit transforms the angular distribution of light incident or to be incident on the diffractive optical element into plural predetermined distributions. Advantageously, this feature of Claims 18, 29 and 30 permits changing the size of a light intensity distribution produced by a diffractive optical element.

Shiraishi may disclose at lines 40-44 of column 28 with respect to Fig. 20 that "the illumination luminous fluxes emerging from the mercury lamp 1 are condensed at a second focal point of the elliptical mirror 2. Thereafter, the diffraction grating pattern plate 12 is irradiated with the condensed luminous flux via a mirror 6 and a lens system 71 of a relay system." As a result, Shirashi's arrangement of a lens system 71 that collects light beams diverging from the second focal point of the elliptical mirror 2 only projects light from the second focal point onto the diffraction grating plate 12 as a single distribution. In contrast to Shiraishi, it is a feature of Claims 18, 29 and 30 that an angular distribution transforming unit transforms the angular distribution of light incident or to be incident on a diffractive optical element into plural predetermined distributions. Accordingly, it is not seen that Shiraishi's collecting of divergent light and projecting it onto a diffraction grating plate which provides only a single distribution in any way teaches of suggests this feature of Claims 18, 29 and 30 of transforming an angular distribution of light incident on a diffractive optical element into plural predetermined distributions. It is therefore believed that Claims 18, 29 and 30 as currently amended are completely distinguished from Shiraishi and are allowable.

Independent Claims 26, 31 and 34 as currently amended are directed to an illumination optical arrangement that illuminates a surface to be illuminated using light from a light source. In the illumination optical system, a diffractive element forms a desired light intensity distribution on a predetermined plane. An angular distribution transforming unit transforms the angular distribution of light incident or to be incident on the diffractive optical element into a desired distribution. An internal reflection member is effective to make the light intensity distribution of the light incident on its light entrance surface uniform. The light entrance surface of the internal reflection member and the diffractive optical element are optically conjugate with each other. Light from the diffractive optical element is incident on the light entrance surface of the internal reflection member and the surface to be illuminated is illuminated with light from the internal reflection member. In Claim 31, a projection optical system projects a pattern of a mask illuminated with light from the illumination optical system onto a wafer. In Claim 34, a projection optical system is used to transfer a pattern of a mask onto a wafer and the transferred pattern is developed.

Claims 26, 31 and 34 which have been indicated as allowable were previously rejected under 35 U.S.C. § 102(e) as anticipated by U.S. Patent 6,285,443 (Wangler et al. '443).

In Applicant's opinion, Wangler et al. discloses an illuminating arrangement for a projection microlithographic apparatus that has a laser and an objective. Diffractive optical raster elements having a two-dimensional raster structure are mounted in the exit pupil and the object plane, respectively, of the objective or in planes equivalent thereto. The illuminating arrangement provides an adapted increase of the light-conductance value and shapes the light beam, for example, into a circular shape, an annular shape or a quadrupole shape. The

illuminating arrangement is suitable for combining with a zoom lens or an axicon objective as well as with a glass rod.

It is a feature of Claims 26, 31 and 34 that the light entrance surface of the internal reflection member and the diffractive optical element are optically conjugate with each other. The Examiner has suggested that Wangler et al. '443 shows a diffractive optical element (diffractive element 8) and an internal reflection element (glass rod 5). The Wangler disclosure, however, is devoid of any teaching or suggestion that the glass rod 5 and the diffractive element 8 are optically conjugate with each other. In view of the lack of any conjugate relationship between an internal reflection element and a diffractive optical element in Wangler et al., it is not seen that Wangler et al. in any manner teaches or suggests the features of Claims 26, 31 and 34. It is therefore believed that Claims 26, 31 and 34 as currently amended are completely distinguished from Wangler et al. and are allowable.

Newly added Claim 39 depending from independent Claim 26 recites the further feature that the angular distribution transforming unit of Claim 26 transforms the angular distribution into plural predetermined distributions. As discussed with respect to Claims 18, 29 and 30, this feature is clearly disclosed in the specification at lines 22 through 24 of page 18. No new matter is believed to have been added.

For the foregoing reasons, Applicant submits that the present invention, as recited in independent claims 18, 26, 29-31 and 34, is patentably defined over the cited art.

Dependent claims 19-25 and 37-39 also should be deemed allowable, in their own right, for defining other patentable features of the present invention in addition to those recited in their

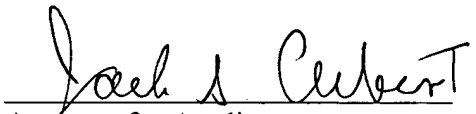
respective independent claims. Further individual consideration of these dependent claims is requested.

Applicant submits that this Amendment After Final Rejection clearly places this application in condition for allowance. This Amendment was not earlier presented because Applicant believed that the prior Amendment placed the application in condition for allowance. Accordingly, entry of the instant Amendment, as an earnest attempt to advance prosecution and reduce the number of issues, is requested under 37 CFR 1.116.

Applicant also request favorable reconsideration, withdrawal of the rejections set forth in the above-noted Office Action and an early Notice of Allowance of this application.

Applicant's attorney, Steven E. Warner, may be reached in our Washington, D.C. office by telephone at (202) 530-1010. All correspondence should be directed to our address listed below.

Respectfully submitted,



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